What is Claimed is:

1. A pressure support system comprising:

a pressure generator having an inlet portion and an outlet portion for generating a flow of gas;

a first conduit having a first end associated with a gas source and a second end coupled to the inlet portion of the pressure generator to supply gas from a gas source to the pressure generator, the first conduit defining a tortuous path between the first end and the second end;

a second conduit having a first end coupled to the outlet portion of the pressure generator and a second end to deliver the flow of gas from the pressure generator to a patient; and

a valve assembly operatively connected to the first conduit and the second conduit, wherein the valve assembly communicates gas from the second conduit to the first conduit to control one of a pressure and a rate of the flow of gas in the second conduit.

2. A pressure support device according to claim 1, further comprising a noise dampening material disposed along at least a portion of the first conduit.

3. A pressure support device according to claim 1, wherein the valve assembly is configured and arranged to control simultaneously (1) a degree of restriction

for the flow of gas from the pressure generator and (2) a degree of restriction for a flow of gas from the second conduit to the first conduit.

4. A pressure support system according to claim 1, wherein the valve assembly communicates a first portion of the flow of gas from the second conduit to the first conduit and communicates a second portion of the flow of gas from the pressure generator to the first conduit simultaneously in order to control one of a pressure and a rate of flow of gas communicated to a patient by the second conduit.

5. A pressure support system according to claim 1, wherein the valve assembly includes:

a hollow first cylinder having an open first end, an open second end, a blower discharge slot defined in a wall thereof, an exhaust discharge slot defined in the wall thereof between the blower discharge slot and the second end, and a separating plate positioned in the first cylinder between the exhaust discharge slot and the blower discharge slot, with the first end of the first cylinder disposed in fluid communication with the outlet portion of the pressure generator, and with the second end of the first cylinder disposed in fluid communication with the first conduit;

a hollow second cylinder having a first slot defined in a wall thereof, with the second cylinder positioned coaxially around the first cylinder; and

an actuator operatively coupled to one of the first cylinder and the second cylinder to move the second cylinder axially relative to the first cylinder.

6. A pressure support system according to claim 5, wherein during operation of the pressure support system, the blower discharge slot overlaps the first slot provided in the second cylinder to define an aperture in the valve assembly, wherein movement of the second cylinder relative to the first cylinder changes the size of the aperture to control a degree of restriction for the flow of gas from the pressure generator into the second conduit.

7. A pressure support system according to claim 6, wherein at least a portion of the blower discharge slot is defined in the first cylinder in one of a spiral, a circular, arched and a diagonal configuration.

8. A pressure support system according to claim 5, wherein during operation of the pressure support system, the exhaust discharge slot overlaps the first slot provided in the second cylinder to define an exhaust aperture in the valve assembly, wherein movement of the second cylinder relative to the first cylinder changes the size of the exhaust aperture to control a degree of restriction for the flow of gas from the second conduit into the first conduit.

9. A pressure support system according to claim 8, wherein at least a portion of the exhaust discharge slot is defined in the first cylinder in one of a spiral, a circular, arched and a diagonal configuration.

10. A pressure support system according to claim 5, wherein during operation of the pressure support system, both the blower discharge slot and the exhaust discharge slot overlap the first slot provided in the second cylinder, wherein overlap of the blower discharge slot and the first slot define a first aperture in the valve assembly and overlap of the exhaust discharge slot and the first slot define a second aperture in the valve assembly, wherein movement of the second cylinder relative to the first cylinder simultaneously changes the size of the first aperture and the second aperture to control a degree of restriction for the flow of gas from the pressure generator into the second conduit and a degree of restriction for the flow of gas from the second conduit to the first conduit.

11. A pressure support system according to claim 5, wherein the actuator comprises:

a magnet secured to one of the first cylinder and the second cylinder; and

a coil secured around the other of the first cylinder and the second cylinder in magnetic flux coupled relation with the magnet.

12. A pressure support system according to claim 11, wherein in response to receiving a DC current of a first polarity, the coil urges the second cylinder axially relative to the first cylinder so that the first slot of the second cylinder and the blower discharge slot of the first cylinder overlap, and wherein in response to receiving DC current of a second polarity opposite the first polarity, the coil urges the second cylinder

axially relative to the first cylinder so that the first slot of the second cylinder and the exhaust intake slot of the first cylinder overlap.

13. A pressure support system according to claim 5, wherein a clearance is provided between the first cylinder and the second cylinder sufficient to provide a continuous flow of gas from the pressure generator.

14. A pressure support system according to claim 5, wherein at least one of the blower discharge slot, the exhaust discharge slot, and the first slot is shaped to so as to have a varying mechanical gain.

15. A pressure support system according to claim 1, further comprising a port defined in the second conduit for directing a portion of the flow of gas from the second conduit for cooling purposes.

16. A pressure support system according to claim 1, further including:

a pressure sensor that measures fluid pressure in the second conduit and produces a pressure signal indicative thereof;

a flow sensor that measures fluid flow in the second conduit and produces a flow signal indicative thereof; and

a controller operatively coupled to the pressure sensor and the fluid sensor and to the valve assembly, wherein the controller actuates the valve assembly to control the delivery of gas from the second conduit to the first conduit and the delivery of the

flow of gas from the pressure generator into the second conduit simultaneously as a function of at least one of the pressure signal and the flow signal.

17. A pressure support system comprising:

pressure generating means for generating a flow of gas;

first delivering means for communicating an inlet of the pressure generating means to a source of gas;

second delivering means for communicating the flow of gas from the pressure generating means to a patient; and

valving means for selectively communicating gas from the second delivering means to the first delivering means to control one of a pressure and a rate of the flow of gas in the second delivering means.

18. A pressure support system according to claim 17, further comprising means disposed in the first delivery means for suppressing noise.

19. A pressure support system according to claim 17, wherein the valving means alters a rate at which gas is communicated from the second delivering means to the first delivering means depending on whether such a patient is in an inspiratory phase or an expiratory phase of a breathing cycle.

20. A pressure support system according to claim 17, wherein the valving means comprises a single valve that communicates a first portion of the flow of gas from

the second delivery means to the first delivery means and communicates a second portion of the flow of gas from the pressure generating means to the first delivery means simultaneously in order to control one of a pressure and a rate of flow of gas communicated to a patient by the second delivery means.

21. A pressure support system according to claim 17, further comprising:

means for monitoring a characteristic associated with the flow of gas; and

means for actuating the valving means to control the flow of gas based on the result of the monitoring.

22. A pressure support system according to claim 17, further comprising means for delivering a continuous flow of gas from the pressure generating means.

23. A pressure support system according to claim 22, wherein the means for delivering a continuous flow of gas comprises at least one of (1) an exhaust port defined in the second delivery means for providing the continuous flow of gas as a cooling flow of gas and (2) a continuous leak in the valving means.

24. A method of providing pressure support comprising:

communicating an inlet of a pressure generator to a source of gas via a first conduit;

generating a flow of gas with the pressure generator;

communicating the flow of gas from the pressure generator to a patient via a second conduit; and

communicating gas from the second conduit to the first conduit to control one of a pressure and a rate of the flow of gas in the second conduit.

25. A method according to claim 24, wherein communicating gas from the second conduit to the first conduit includes altering a rate at which gas is communicated from the second conduit to the first conduit depending on whether a patient is in an inspiratory or an expiratory phase of a breathing cycle.

26. A method according to claim 24, wherein communicating gas from the second conduit to the first conduit includes communicating a first portion of the flow of gas from the second conduit to the first conduit and communicating a second portion of the flow of gas from the pressure generator to the second conduit simultaneously in order to control one of a pressure and a rate of flow of gas in the second conduit.

27. A method according to claim 24, further comprising providing a continuous flow of gas from the pressure generator.

28. A method according to claim 24, further comprising:

monitoring a characteristic associated with the flow of gas; and

controlling the flow of gas based on the result of the monitoring.

29. A valve assembly comprising:

a hollow first cylinder having an open first end, an open second end, a blower discharge slot defined in a wall thereof, an exhaust intake slot defined in the wall thereof between the blower discharge slot and the second end, and a separating plate disposed in the first cylinder between the blower discharge slot and the exhaust intake slot;

a hollow second cylinder having a first slot defined in a wall thereof, with the second cylinder positioned coaxially around the first cylinder; and

an actuator associated with the first cylinder and the second cylinder for moving the second cylinder axially with respect to the first cylinder.

30. A valve assembly according to claim 29, wherein the actuator comprises:

a magnet secured to one of the first cylinder and the second cylinder; and

a coil secured around the other of the first cylinder and the second cylinder in magnetic flux coupled relation with the magnet and configured to receive DC current.

31. A valve assembly according to claim 29, wherein:

the first cylinder includes a center barrel, a first barrel, and a second barrel, with the first barrel and the second barrel positioned coaxially at opposite ends of the center barrel;

the magnet is mated with the center barrel;

the second cylinder has the coil received therearound;

the second cylinder is received in sliding engagement around the magnet and the center barrel with the first slot of the second cylinder positioned at the end of the first cylinder adjacent the second barrel; and

the second barrel includes the blower discharge slot, the exhaust discharge slot, and the separating plate, with the second barrel having one end received in the end of the second cylinder opposite the first barrel and secured to the end of the center barrel.

32. A valve assembly according to claim 29, wherein the magnet and coil are configured and arranged such that in response to receiving DC current of a first polarity, the coil urges the second cylinder axially relative to the first cylinder so that the first slot of the second cylinder and the blower discharge slot of the first cylinder overlap, and so that in response to receiving DC current of a second polarity, opposite the first polarity, the coil urges the second cylinder axially relative to the first cylinder so that the first slot of the second cylinder and the exhaust intake slot of the first cylinder overlap.

33. A valve assembly according to claim 29, wherein the first cylinder has stops at opposite ends thereof that coact with ends of the second cylinder to restrict axial movement of the second cylinder between the ends of the first cylinder.

34. A valve assembly according to claim 33, wherein at least one stop at an end of the first cylinder is comprised of a shoulder formed therearound.

35. A valve assembly according to claim 29, wherein at least a portion of at least one of the blower discharge slot and the exhaust intake slot is defined in the first cylinder in one of a diagonal, circular, arched and a spiral configuration.

36. A valve assembly according to claim 29, wherein at least one of the blower discharge slot, the exhaust discharge slot, and the first slot is shaped to so as to have a varying mechanical gain.

37. A valve assembly according to claim 29, wherein during operation, the blower discharge slot overlaps the first slot provided in the second cylinder to define an aperture in the valve assembly, wherein movement of the second cylinder relative to the first cylinder changes the size of the aperture.

38. A valve assembly according to claim 29, wherein during operation of the pressure support system, the exhaust discharge slot overlaps the first slot provided in the second cylinder to define an exhaust aperture in the valve assembly, wherein movement of the second cylinder relative to the first cylinder changes the size of the exhaust aperture.

39. A valve assembly according to claim 29, wherein during operation of the pressure support system, both the blower discharge slot and the exhaust discharge slot overlap the first slot provided in the second cylinder, wherein overlap of the blower discharge slot and the first slot define a first aperture in the valve assembly and overlap of

the exhaust discharge slot and the first slot define a second aperture in the valve assembly, wherein movement of the second cylinder relative to the first cylinder simultaneously changes the size of the first aperture and the second aperture.

40. A valve assembly according to claim 29, wherein a clearance is provided between the first cylinder and the second cylinder sufficient to provide a continuous flow of gas therethrough.

41. A pressure support system comprising:

a pressure generator having an inlet portion and an outlet portion for generating a flow of gas;

a first conduit having a first end open to ambient atmosphere and a second end coupled to the inlet portion of the pressure generator to supply gas from a gas source to the pressure generator;

a second conduit having a first end coupled to the outlet portion of the pressure generator and a second end to deliver the flow of gas from the pressure generator to a patient; and

a valve assembly operatively connected to the second conduit to control one of a pressure and a rate of the flow of gas in the second conduit, wherein the valve assembly comprises:

a hollow first cylinder having an open first end, an open second end, a blower discharge slot defined in a wall thereof, an exhaust intake slot defined in the wall thereof between the blower discharge slot and the second end,

and a separating plate disposed in the first cylinder between the blower discharge slot and the exhaust intake slot;

a hollow second cylinder having a first slot defined in a wall thereof, with the second cylinder positioned coaxially around the first cylinder; and

an actuator associated with the first cylinder and the second cylinder for moving the second cylinder axially with respect to the first cylinder;

42. A pressure support system according to claim 41, further comprising a port defined in the second conduit for directing a portion of the flow of gas from the second conduit for cooling purposes.

43. A pressure support system according to claim 41, further including:

a pressure sensor that measures fluid pressure in the second conduit and produces a pressure signal indicative thereof;

a flow sensor that measures fluid flow in the second conduit and produces a flow signal indicative thereof; and

a controller operatively coupled to the pressure sensor and the fluid sensor and to the valve assembly, wherein the controller actuates the valve assembly to control one of a pressure and a rate of the flow of gas in the second conduit.

44. A pressure support system according to claim 41, wherein a clearance is provided between the first cylinder and the second cylinder sufficient to provide a continuous flow of gas therethrough from the pressure generator.

45. A pressure support system according to claim 41, wherein at least one of the blower discharge slot, the exhaust discharge slot, and the first slot is shaped to so as to have a varying mechanical gain.